



Study of the horizontal and vertical dispersion at the atmospheric flow at the Alcântara Launching Center

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The Alcântara Launching Center (ALC) region is situated in the north coast of the Maranhão state and it was simulated in a wind tunnel with an open circuit at Institute Technologic of Aeronautics (ITA). The ALC topography possesses typical characteristics of smooth surface (ocean) close to a roughness surface (continent). The local coast has a relative topographical variation (coastal cliffs) with inclination and 50 m height, being the top a plain area. A mock-up model has been constructed to be inserted at the wind tunnel for the measurements. The Integration Mobile Tower (IMT) is placed at 150 m from the coastal cliff. Consequently the rockets can suffer the influence from intense turbulence resultant of the modification of the wind profile of the proceeding from the ocean as ascending vertically from the IMT. It was used the Particle Image Velocimetry's (PIV) technique for the analysis of the vertical dispersion in the central lane from the ocean until the IMT and the hot wire anemometry technique for the horizontal dispersion. The analysis of the vertical dispersion was carried through locating the PIV transversally to the model that simulates the ALC. The vorticity generated above of the coastal cliff has the same intensity of the vorticity generated at the IMT (-2000 s-1) being these the zones of higher turbulence. With regard to the horizontal flow one noticed that the low levels (below 10 m) presented the great speed fluctuations close the coastal cliff. In the high levels (above 10 m), this fluctuations diminished. The high values of turbulent intensities after the step, in the low levels, due to recirculation characterized for low values of speeds average and hight speed fluctuations also was verified in the vertical dispersion.